CLAIMS

1. A method of measuring characteristics of an organ or part multiple images of the organ or part thereof, the method comprising the steps of

defining the spatial position of at least two of the images;

defining a reference model of the organ or part thereof scaled the distance between reference markers on the images;

defining one or more boundary guide points associated with images for which the spatial positions have been defined;

converting the guide points to three-dimensional coordinates;

defining an estimate model by fitting the reference model to the guide points; and

calculating the characteristics from the estimate model.

2. A method as claimed in claim 1 wherein the distance between the reference markers is calculated by the steps of defining a point on each of two images; defining a reference line in 3-dimensional space between the points; and calculating the distance as a function of the length of the reference line.

3. A method as claimed in claim 2 wherein the reference model comprises a mathematically defined reference model defined in a polar coordinate system.

4. A method as claimed in claim 3 wherein the reference model comprises an ellipsoid having the reference line as a central axis and one or more surface points, each surface point specified by a radial distance from the central axis.

5. A method as claimed in any one of the preceding claims comprising the steps of displaying one or more images to a user and superimposing on the image a representation of the intersection of the reference model with the image.

6. A method as claimed in claim 5 further comprising the step of performing image processing on one or more of the images.

7. A method as claimed in claim 5 or claim 6 wherein the user performs the step of defining one or more boundary points on the image(s).

8. A method as claimed in any one of the preceding claims further comprising the step of calculating the volume of the subject organ or part from the estimate model.

9. A method as claimed in any one of the preceding claims further comprising the step of calculating the mass of the subject organ or part from the estimate model.

10. A method as claimed in any one of the preceding claims wherein the subject organ comprises a ventricle of the heart and the characteristics measured include ventricular mass, endocardial volume and/or wall thickness of all of the ventricle or part thereof.

11. A method as claimed in any one of the preceding claims wherein the subject organ comprises a ventricle of the heart and the characteristics measured include ventricular abnormalities identified through changes in wall thickness over time.

12. A method as claimed in any one of claims 1 to 9 wherein the subject organ comprises a kidney and the characteristics measured include cortical thickness.

13. A system for measuring characteristics of an organ or part thereof of a subject from multiple images of the subject's organ or part thereof, the system comprising:

a memory in which is stored the spatial position of at least two of the images;

reference model definition means arranged to define a reference model of the organ or part thereof scaled according to the distance between the reference markers on the images;

boundary guide point definition means arranged to define one or more boundary guide points associated with one or more images for which the spatial positions are stored in the memory;

conversion means arranged to convert the guide points to three-dimensional coordinates;

estimate model definition means arranged to define an estimate model by fitting the reference model to the guide points; and

calculation means arranged to calculate the characteristics from the estimate model.

14. A system as claimed in claim 13 wherein the reference model definition means is arranged to calculate the distance between the reference markers by the steps of defining a point on each of two images; defining a reference line in 3-dimensional space between the points; and calculating the distance as a function of the length of the reference line.

15. A system as claimed in claim 14 wherein the reference model comprises a finite element model defined in a polar coordinate system.

16. A system as claimed in claim 15 wherein the reference model comprises an ellipsoid having the reference line as a central axis and one or more surface points, each surface point specified by a radial distance from the central axis.

17. A system as claimed in any one of claims 13 to 16 further comprising display means arranged to display one or more images to a user and to superimpose on the image a representation of the intersection of the reference model with the image slice.

18. A system as claimed in claim 17 further comprising image processing means arranged to perform image processing on one or more of the images.

19. A system as claimed in claim 17 or claim 18 wherein the boundary guide point definition means is arranged to obtain preferred guide point positions from a user.

20. A system as claimed in any one of cliams 13 to 19 further comprising volume calculation means arranged to calculate the volume of the suject organ or part from the estimate model.

21. A system as claimed in any one of cliams 13 to 20 further comprising mass calculation means arranged to calculate the mass of the subject organ or part from the stimate model.

22. A system as claimed in any one of cliams 13 to 21 wherein the subject organ comprises a ventricle of the heart and the characteristics measured include ventricular mass, endocardial volume and/or wall thickness of all of the ventricle or part thereof.

23. A system as claimed in any one of claims 13 to 22 wherein the subject organ comprises a ventricle of the heart and the characteristics measured include ventricular abnormalities identified through changes in wall thickness over time.

24. A system as claimed in any one of claims 13 to 21 wherein the subject organ comprises a kidney and the characteristics measured include cortical thickness.

25. A computer program for measuring characteristics of an organ or part thereof of a subject from multiple images of the subject's organ or part thereof, the program comprising:

storage means arranged to store the spatial position of at least two of the images;

reference model definition means arranged to define a reference model of the organ or part thereof scaled according to the distance between the reference markers on the images;

boundary guide point definition means arranged to define one or more boundary guide points associated with one or more images for which the spatial positions are stored in the memory;

conversion means arranged to convert the guide points to three-dimensional coordinates;

estimate model definition means arranged to define an estimate model by fitting the reference model to the guide points; and

calculation means arranged to calculate the characteristics from the estimate model.

26. A program as claimed in claim 25 wherein the reference model definition means is arranged to calculate the distance between the images by the steps of defining a point on each of two images; defining a reference line in 3-dimensional space between the points; and calculating the distance as a function of the length of the reference line.

27. A program as claimed in claim 26 wherein the reference model comprises a finite element model defined in a polar coordinate system.

28. A program as claimed in claim 27 wherein the reference model comprises an ellipsoid having the reference line as a central axis and one or more surface points, each surface point specified by a radial distance from the central axis.

29. A program as claimed in any one of claims 25 to 28 further comprising display means arranged to display one or more images to a user and to superimpose on the image a representation of the intersection of the reference model with the image.

30. A program as claimed in claim 29 further comprising image processing means arranged to perform image processing on one or more of the images.

31. A program as claimed in claim or claim 30 wherein the boundary guide point definition means is arranged to obtain preferred guide point positions from a user.

32. A program as claimed in any one of claims 25 to 31 further comprising volume calculation means arranged to calculate the volume of the subject organ or part from the estimate model.

33. A program as claimed in any one of cliams 25 to 32 further comprising mass calculation means arranged to calculate the mass of the subject organ or part from the estimate model.

34. A program as claimed in any one of claims 25 to 33 wherein the subject organ comprises a ventricle of the heart and the characteristics measured include ventricular mass, endocardial volume and! or wall thickness of all of the ventricle or part thereof.

35. A program as claimed in any one of claims 25 to 34 wherein the subject organ comprises a ventricle of the heart and the characteristics measured include ventricular abnormalities identified through changes in wall thickness over time.

36. A program as claimed in any one of cliams 25 to 33 wherein the subject organ comprises a kidney and the characteristics measured include cortical thickness.

37. A computer program as claimed in any one of claims 25 to 35 embodied on a computer readable medium.